This listing of claims will replace prior versions, and listings, of claims in the application:

Listing Of Claims:

1. (Currently Amended) Interferometric apparatus comprising:

means for defining a reference frame;

a translation stage;

an electro-mechanical arrangement for selectively translating said translation stage in at least one of at least two orthogonal directions with respect to said reference frame;

at least one thin, elongated mirror mounted in a predetermined manner with respect to said reference frame, said at least one thin, elongated mirror having a reflecting surface and a nominal datum line extending along its longitudinal dimension;

at least one interferometer subsystem, including a dynamic interferometer, mounted in a predetermined manner with respect to said at least one thin, elongated mirror; adapted to cooperate with said at least one thin, elongated mirror to measure the displacement of said translation stage in at least one azimuth; and adapted to measure the local slope of said at least one thin, elongated mirror along and orthogonal to its datum line and its local displacement normal to said reflecting surface;

control means having a mode of operation for selectively translating said translation stage, said at least one thin, elongated mirror and said at least one interferometer subsystem moving relative to one another in said mode of operation so that said at least one interferometer subsystem scans said at least one thin, elongated mirror along its corresponding datum line to generate a signal containing information indicative of the ~~angular change and surface departure~~ topography of said reflecting surface ~~thereof~~ along with any contributions thereto due to variations present from said electro-mechanical arrangement per se; and

signal and analysis means for extracting said information contained in said signal and ~~determining the local shape of said at least one thin, elongated mirror~~developing correction signals to compensate for errors in optical path length and errors in beam direction related to the shape of said reflecting surface while said control means is in said mode of operation.

2. (Original) The interferometric apparatus of claim 1 wherein said at least one thin, elongated mirror is mounted to said translation stage for movement therewith and said at least one interferometer subsystem is fixedly mounted off said translation stage.

3. (Original) The interferometric apparatus of claim 1 wherein said at least one interferometer subsystem is fixedly mounted to said translation stage for movement therewith and said at least one thin, elongated mirror is fixedly mounted off said translation stage.

4. (Original) The interferometric apparatus of claim 1 wherein said control means is structured and arranged to have another mode of operation in which the motion of said translation stage is measured in at least one azimuth with respect to said reference frame.

5. (Currently Amended) The interferometric apparatus of claim 1 comprising at least two, thin elongated mirrors having reflecting surfaces orthogonally arranged with respect to one another and each including a nominal datum line extending along its longitudinal dimension and at least two interferometer subsystems at least in part mounted off said translation stage, each of said at least two interferometer subsystems being adapted to scan a corresponding one of said thin, elongated mirrors and configured to measure the local slope of the scanned mirror along and orthogonal to its datum line and its local displacement normal to said reflecting surface, said control means being further configured in said mode of operation to selectively translate said translation stage in one or all of its possible directions of motion so that at least one of said interferometer subsystems scans a corresponding one of said thin, elongated mirrors along its corresponding datum line to generate a signal containing information indicative of the ~~angular change and surface departure~~surface topography of its corresponding reflecting surface along with any contributions thereto due to variations present from said electro-mechanical arrangement per se while the other of said interferometer subsystems generates a signal containing at least information about the angular change of said translation stage, said signal combining and analysis means extracting information contained in said signals ~~and determining the local shape~~to

develop correction signals to compensate for errors in optical path length and errors in beam direction related to the shape of said at least two thin, elongated mirrors.

6. (Original) The apparatus of claim 1 wherein said at least one interferometer subsystem comprises a single beam, plane mirror interferometer subsystem.

7. (Currently Amended) The interferometric apparatus of claim 1 wherein said interferometric apparatus comprises three orthogonally arranged thin, elongated mirrors and three corresponding interferometer subsystems mounted for relative motion with respect to one another while said control means is in said mode of operation to measure the ~~local shape~~surface topography of said mirrors in three dimensions.

8. (Original) The interferometric apparatus of claim 1 further including a photolithographic wafer mount located on said translation stage for movement therewith.

9. (Original) The interferometric apparatus of claim 8 further including a photolithographic exposure unit fixedly mounted to said reference frame for forming masked patterns on wafers located on said translation stage.

10. (Currently amended) Interferometric method comprising the steps of:

defining a reference frame;

providing a translation stage for movement with respect to said reference frame;

selectively translating said translation stage in at least one of at least two orthogonal directions with respect to said reference frame;

mounting at least one thin, elongated mirror in a predetermined manner with respect to said reference frame, said at least one thin, elongated mirror having a reflecting surface and a nominal datum line extending along its longitudinal dimension;

mounting at least one interferometer subsystem, including a dynamic interferometer, in a predetermined manner with respect to said at least one thin, elongated mirror where said at least one interferometer subsystem is adapted to cooperate with said at least one thin, elongated mirror to measure the displacement of said translation stage in at least one azimuth and is also adapted to measure the local

slope of said at one thin, elongated mirror along and orthogonal to its datum line and its local displacement normal to said reflecting surface;

selectively translating said translation stage in a mode of operation in which said at least one thin, elongated mirror and said at least one interferometer subsystem move relative to one another in said mode of operation so that said at least one interferometer subsystem scans said at least one thin, elongated mirror along its corresponding datum line to generate a signal containing information indicative of the ~~angular change and surface departure~~topography of said reflecting surface ~~thereof~~ along with any other contributions thereto due to variations present during said step of selectively translating said translation stage; and

extracting said information contained in said signal and ~~determining the local shape~~developing correction signals to compensate for errors in optical path length and errors in beam direction related to the shape of said reflecting surface of said at least one thin, elongated mirror while is in said mode of operation.

11. (Original) The interferometric method of claim 10 wherein said at least one thin, elongated mirror is mounted to said translation stage for movement therewith and said at least one interferometer subsystem is fixedly mounted off said translation stage.

12. (Original) The interferometric method of claim 10 wherein said at least one interferometer subsystem is fixedly mounted to said translation stage for movement therewith and said at least one thin, elongated mirror is fixedly mounted off said translation stage.

13. (Original) The interferometric method of claim 10 having another mode of operation in which the motion of said translation stage is measured in at least one azimuth with respect to said reference frame.

14. (Currently Amended) The interferometric method of claim 10 in which there are provided at least two, thin elongated mirrors having reflecting surfaces orthogonally arranged with respect to one another with each including a nominal datum line extending along its longitudinal dimension and at least two interferometer subsystems at least in part mounted off said translation stage, each of said at least two interferometer

subsystems being adapted to scan a corresponding one of said thin, elongated mirrors and configured to measure the local slope of the scanned mirror along and orthogonal to its datum line and its local displacement normal to said reflecting surface, said method being further configured in said mode of operation to selectively translate said translation stage in one or all of its possible directions of motion so that at least one of said interferometer subsystems scans a corresponding one of said thin, elongated mirrors along its corresponding datum line to generate a signal containing information indicative of the ~~angular change and surface departure~~topography of its corresponding reflecting surface along with any contributions thereto due to variations present from any other contributions present during said step of selectively translating said translation stage while the other of said interferometer subsystems generates a signal containing at least information about the angular change of said translation stage, said step of extracting information contained in said signals ~~determining the local shape~~developing correction signals to compensate for errors in optical path length and errors in beam direction related to the shape of said at least two thin, elongated mirrors.

15. (Original) The interferometric method of claim 10 wherein said at least one interferometer subsystem comprises a single beam, plane mirror interferometer

16. (Original) The interferometric method of claim 10 in which there are provided three orthogonally arranged thin, elongated mirrors and three corresponding interferometer subsystems mounted for relative motion with respect to one another while in said mode of operation to measure the local shape of said mirrors in three dimensions.

17. (Original) The interferometric method of claim 10 further including the step of mounting a photolithographic wafer on said translation stage for movement therewith.

18. (Original) The interferometric method of claim 17 further including photolithographically exposing said wafer from said reference frame with masked patterns of illumination.

19. (Previously Added) Interferometric apparatus comprising:

means for defining a reference frame;

a translation stage;

an electro-mechanical arrangement for selectively translating said translation stage in at least one of at least two orthogonal directions with respect to said reference frame;

at least two thin elongated mirrors mounted in a predetermined manner with respect to said reference frame, said at least two thin elongated mirrors each having reflecting surfaces orthogonally arranged with respect to one another and each including a nominal datum line extending along its longitudinal dimension;

at least two interferometer subsystems mounted in a predetermined manner with respect to said at least two thin elongated mirrors and adapted to cooperate with said at least two thin elongated mirrors to measure the displacement of said translation stage in at least one azimuth; each of said at least two interferometer subsystems being adapted to scan a corresponding one of said two thin elongated mirrors and configured to measure the local slope of the scanned mirror along and orthogonal to its datum line and its local displacement normal to said reflecting surface;

control means having a mode of operation for selectively translating said translation stage, said control means being configured in said mode of operation to selectively translate said translation stage in one or all of its possible directions of motion so that at least one of said interferometer subsystems scans a corresponding one of said thin, elongated mirrors along its corresponding datum line to generate a signal containing information indicative of the angular change and surface departure of its corresponding reflecting surface along with any contributions thereto due to variations present from said electro-mechanical arrangement per se while the other of said interferometer subsystems generates a signal containing at least information about the angular change of said translation stage, said signal combining and analysis means extracting information contained in said signals and determining the local shape of said at least two thin, elongated mirrors; and

signal and analysis means for extracting said information contained in said signal and determining the local shape of said at least one thin, elongated mirror while said control means is in said mode of operation.

20. (Previously Added) Interferometric method comprising the steps of:

defining a reference frame;

providing a translation stage for movement with respect to said reference frame;

selectively translating said translation stage in at least one of at least two orthogonal directions with respect to said reference frame;

mounting at least two, thin elongated mirrors in a predetermined manner with respect to said reference frame, said at least two thin elongated mirrors each having reflecting surfaces orthogonally arranged with respect to one another and each including a nominal datum line extending along its longitudinal dimension;

mounting at least two interferometer subsystems mounted in a predetermined manner with respect to said at least two thin elongated mirrors and adapted to cooperate with said at least two thin elongated mirrors to measure the displacement of said translation stage in at least one azimuth; each of said at least two interferometer subsystems being adapted to scan a corresponding one of said two thin elongated mirrors and configured to measure the local slope of the scanned mirror along and orthogonal to its datum line and its local displacement normal to its reflecting surface;

selectively translating said translation stage in a mode of operation in which said at least said two, thin elongated mirrors and said at least two interferometer subsystems move with respect to one another in one or all of said translation stage's possible directions of motion so that at least one of said interferometer subsystems scans a corresponding one of said at least two thin elongated mirrors along its corresponding datum line to generate a signal containing information indicative of the angular change and surface departure of its corresponding reflecting surface along with any contributions thereto due to variations present from said electro-mechanical arrangement per se while the other of said interferometer subsystems generates a signal containing at least information about the angular change of said translation stage; and

extracting said information contained in said signal and determining the local shape of said at least two thin, elongated mirrors.

--21. (New) Interferometric apparatus comprising:

at least one interferometer including a mirror moveably mounted for displacement along a path of travel, said interferometer being adapted to direct a measurement beam with a predetermined diameter, d, at the mirror to generate a measurement signal

containing information indicative of the relative displacement of said mirror and to generate an information signal indicative of the topography of the mirror and direction of travel of said measurement beam as reflected from said mirror at points where said measurement beam impinges on said mirror after having made only one pass thereto; and

signal and analysis means for operating on said information signal to develop correction signals to compensate said measurement signal for errors in optical path length and errors in beam direction of said measurement beam related to the shape of said movably mounted mirror and its angular orientation while moving.--